

THE FIRST ZOEAL STAGE OF *SCOPIMERA CRABRICAUDA* ALCOCK (CRUSTACEA, BRACHYURA, OCYPODIDAE).

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ABSTRACT

The first zoeal stage of the ocypodid crab *Scopimera crabricauda* is described and compared with previously described larvae of the same family.

INTRODUCTION

RICE (1975) described the first zoea of *Macrophthalmus depressus* Rüppell and reviewed the available information on larval development within the brachyuran family Ocypodidae, pointing out that there seem to be clear differences between the zoeae of the three recognized sub-families, particularly in the setation of the mouth-parts. However, knowledge of one of these sub-families, the Scopimerinae, is based on published descriptions of the larvae of only five species, belonging to three genera, and most of these accounts are very inadequate. Within the genus *Scopimera* only the first stage of *S. globosus* has been described (Aikawa, 1929) so that when first zoeae were obtained from female *S. crabricauda* collected in Bahrain, Arabian Gulf, a detailed description seemed desirable, even though all the animals died without moulting.

MATERIAL

Two ovigerous female *S. crabricauda* were collected from the foreshore at Jufair, Bahrain, in April 1975 and were maintained in aquaria in the laboratory of the adjacent Fisheries Resources Bureau at a salinity of 42‰ and a temperature of 19 °C until the larvae hatched some ten days later. Although the zoeae were supplied with freshly hatched *Artemia* nauplii, none of them moulted into the second stage.

The adults were fairly confidently identified as *S. crabricauda* since they agree quite well with Alcock's (1900) original description and Kemp's (1919) additional notes based on material from Karachi. Stephensen (1945) identified specimens from Bushire on the coast of Iran as *S. crabricauda*, but pointed out that the sculpturing on the dorsal surface of the carapace was much less pronounced than in the specimens from Pakistan. This sculpturing is similarly unclear in the Bahrain material and, in addition, the blunt ridge on the inner face of the chela seems to be less well developed than Kemp's description suggests. However, agreement in other characters is good, and the identity of the Bahrain animals with Alcock's species is supported by the presence in the same area of males which are apparently conspecific with the

ovigerous females and which possess the racket-shaped abdomen so characteristic of *S. crabricauda*.

The adult female crabs, and the larvae obtained from them, are deposited in the collections of the British Museum (Natural History) under reg. nos 1976:71, 1976:72, 1976:73, 1976:74.

DESCRIPTION OF THE LARVAE

Dimensions. Carapace length (base of rostrum between the eyes to postero-lateral carapace margin) 0.46–0.50 mm. Tip of dorsal to tip of rostral carapace spines 2.46–2.65 mm. Carapace width (tip to tip of lateral spines) 0.44–0.53 mm.

Carapace (Fig. 1a, b). Long dorsal and rostral carapace spines; dorsal spine more than twice carapace length, rostral spine almost three times carapace length. Lateral carapace spines short and straight. Postero-lateral carapace margins naked, but dorsal carapace surface with a pair of small setae anterior to the base of the dorsal spine.

Eyes. Fused.

Antennule. Unsegmented, with 2 terminal aesthetascs and one or two setae.

Antenna (Fig. 1a, b, d). Spinous process about $\frac{1}{3}$ length of rostrum, with a total of about 15 spinules becoming longer distally. No endopod or exopod.

Maxillule (Fig. 1e). Endopod 2-segmented; proximal segment naked, distal with 4 terminal setae.

Maxilla (Fig. 1f). Endopod bi-lobed, with 3 and 2 setae respectively; basal endite bi-lobed with 3 and 4 setae; coxal endite weakly bi-lobed with a total of 5 setae. Scaphognathite with 4 marginal setae and a long, setose posterior process.

Maxilliped 1 (Fig. 1g). Basis with 10 medial setae arranged 2, 2, 3, 3; endopod of 5 segments with 2, 2, 1, 2 and 4+1 setae; third segment with 2–6 very fine hairs on the lateral margin. Exopod with 4 natatory setae.

Maxilliped 2 (Fig. 1h). Basis with 3 medial setae; endopod of 3 segments with 0, 1 and 6 setae respectively. Exopod with 4 natatory setae.

Abdomen (Fig. 1a, c). Somites 2 and 3 with small dorso-lateral process; somites 3 and 4 with short postero-lateral spines. Dorsal surfaces of somites 2–5 and of the telson with many very small spinules arranged in a more or less symmetrical pattern. Telson long and narrow; forks long and divergent, each with a pronounced dorsal spine. Posterior margin with a deep median cleft and with 3 pairs of setae less than half the length of the forks.

DISCUSSION

The characterization on the basis of mouthpart setation of the larvae of the Scopimerinae as opposed to the other ocypodid sub-families, suggested by Rice (1975), is supported without change by this account of the first zoea of *S. crabricauda*.* This short discussion will therefore be restricted to the Scopimerinae.

Although the larvae of *S. crabricauda* resemble very closely Aikawa's (1929) description of the zoea of *S. globosus*, there are nevertheless clear differences between

* The setation of the endopod of the maxillule in *S. globosus* is 0, 4, as in *S. crabricauda*, and not 0, 5 as given by Rice (1975) while a dorsal spine is present on each telson fork in both species.

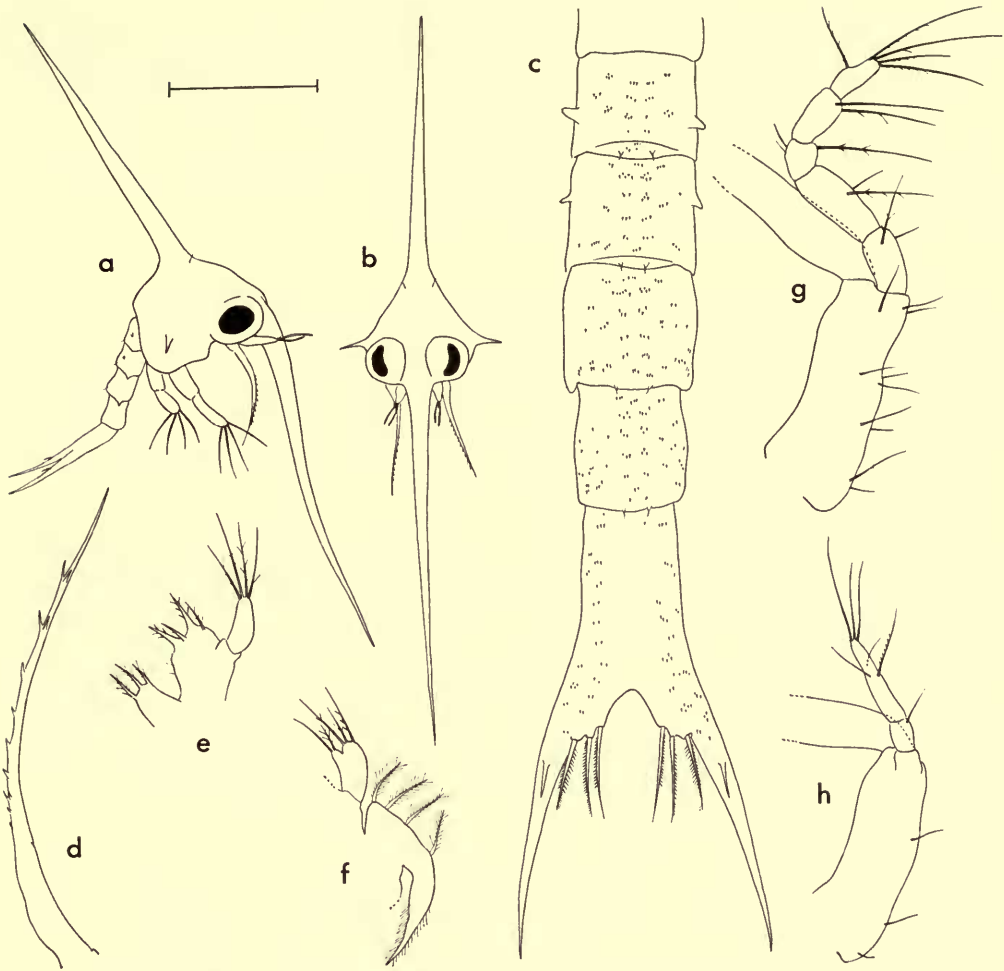


FIG. 1. *Scopimera crabricauda*, stage I zoea: (a) lateral view; (b) frontal view; (c) abdomen; (d) antenna; (e) maxillule; (f) maxilla; (g) first maxilliped; (h) second maxilliped. The bar scale represents 0.5 mm for a and b, and 0.1 mm for c-h.

the two species. First, the dorsal and rostral carapace spines are much longer in *S. crabricauda* (> twice carapace length) than in *S. globosus* (< twice carapace length). Second, these spines are completely naked in *S. crabricauda* whereas Aikawa describes them as 'sparsely toothed' in *S. globosus*. Finally, according to Aikawa's fig. 52, abdominal somites 3 and 4 in *S. globosus* lack the small but clear postero-lateral spines present in *S. crabricauda*.

The available descriptions of the larval stages of other members of the Scopimerinae (see Rice, 1975) are not sufficiently detailed to enable generic characters within the sub-family to be discussed. Nevertheless, it seems that the zoeae of the three genera *Scopimera*, *Ilyoplax* and *Dotilla* may be distinguished between by the lengths of their dorsal and rostral carapace spines relative to the carapace length, these spines being

longest in *Scopimera*, shorter in *Ilyoplax*, and shortest in *Dotilla*. This variation in carapace spine length is reflected in a difference in overall size, the first zoeae of *S. crabricauda* and *S. globosus* being more than 2 mm from the tip of the dorsal spine to the tip of the rostral spine, whereas in the described first stages of *Ilyoplax* and *Dotilla* species this dimension is little more than 1 mm. Finally, the wing-like expansions of the fifth abdominal somite in the zoeae of *Dotilla* species (see Ramadan, 1940; Gohar & Al-kholy, 1957; Rajabai, 1959) clearly distinguish them from the known larvae of both *Scopimera* and *Ilyoplax*.

REFERENCES

- AIKAWA, H. 1929. On the larval forms of some Brachyura. *Rec. oceanogr. Wks Jap.* **9**: 87-162.
- ALCOCK, A. 1900. Materials for a carcinological fauna of India. No. 6. Brachyura, Catometopa or Grapsoidea. *J. Asiat. Soc. Bengal* **69**: 279-456.
- GOHAR, H. A. F. & AL-KHOLY, A. A. 1957. The larvae of some brachyuran Crustacea. *Publs mar. biol. Stn. Ghardaqa* **9**: 146-176.
- KEMP, S. W. 1919. Notes on Crustacea Decapoda in the Indian Museum. XII. Scopimerinae. *Rec. Indian Mus.* **16**: 305-348.
- RAJABAI, K. G. 1959. Studies on the larval development of the Brachyura. I. The early and post larval development of *Dotilla blanfordi* Alcock. *Ann. Mag. nat. Hist.* ser. 13, **2**: 129-135.
- RAMADAN, M. M. 1940. On the first zoeal stage of *Dotilla sulcata* (Forskål). *Ann. Mag. nat. Hist.* ser. 11, **5**: 253-255.
- RICE, A. L. 1975. The first zoeal stages of *Cancer pagurus* L., *Pinnotheres pisum* (Pennant) and *Macrophthalmus depressus* Rüppell (Crustacea, Decapoda, Brachyura). *Bull. Br. Mus. nat. Hist. (Zool.)* **28**: 237-247.
- STEPHENSON, K. 1945. The Brachyura of the Iranian Gulf. *Dan. Scient. Invest. Iran* **4**: 57-257.

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